

**For applications from 0.5 to 15 HP, the MD65 is a simple Sensorless Vector AC Microdrive that can be panel mounted as well as wall or machine mounted.**



*Reliance Electric is proud to introduce the newest sensorless vector control microdrive: The MD65. Following on the success of the MD60, the MD65 continues to establish the reliability and ease of use expected on the Reliance brand drives.*

**PERFORMANCE FEATURES**

- Adjustable Current Limit
  - 10%-150%
- Operator Interface Module
  - Integral Drive Mounted
- Display Lines
  - 4-Character LED Display
- Programmable Preset Speeds
  - Eight
- Analog Outputs
  - One (0-10 VDC or 4 - 20mA)
- Auto Restart
  - Yes
- Frequency Avoidance
  - One Band
- Fault Memory
  - Three Deep
- Digital Inputs
  - Four Logic (Configurable)

**DRIVE SPECIFICATIONS**

- Analog Inputs: Two Total
  - 0-10 VDC: One
  - 4-20 mA: One
- Digital Outputs
  - Two Opto-coupled (Configurable)
- Relay Outputs
  - One Form C (Configurable)
- Meter Outputs
  - 0-10 VDC: One Analog Usable for Meter (Configurable)
- Maximum Load:
  - 10 HP @ 480 VAC
- Overload Capacity
  - Drive Output 150% for One Minute, 200% for Three Seconds
- Frequency Accuracy
  - Digital Keypad: 0.5% of Set Output

- Digital Keypad:  $\pm 0.5\%$  of Maximum Output Frequency
- Input Voltage Tolerance
  - Typically  $\pm 10\%$
- Rated Input Frequency
  - 50/60 Hz (47-63 Hz Range)
- Carrier Frequency:
  - 2-16 kHz (4 kHz default)
- Operating Temperature:
  - $-10^{\circ}$  to  $50^{\circ}\text{C}$  (IP20)
- Snubber (Dynamic Braking):
  - Built-in Transistor
- Dynamic Braking External:
  - Resistor Terminals or DC Bus for Snubber Kit
- DC Braking:
  - Included
- Volts/Hz
  - Custom V/Hz Curve
  - Speed Regulation:  $\pm 2\%$  of motor base speed
  - 40:1 Operating Speed Range
- Sensorless Vector:
  - With Autotune
  - Speed Regulation:  $\pm 1\%$  of motor base speed
  - 60:1 Operating Speed Range
- Frequency Control Range:
  - 0-400 Hz
- Accel/Decel:
  - Independently Adjustable: Two
- Time Range:
  - 0.1 to 600 Seconds
- S Curve Acceleration
  - Yes
- Din Rail Mount
  - Yes on B Frame
- Integral Speed Pot
  - Yes
- Sink/Source Inputs
  - Selectable, 24 VDC Logic

- Electronic Overload Trip
  - Electronic Motor Overload Class 10 Protection
- Communication Option Card
  - DeviceNet
- Serial Communications
  - RS-485 Included for Optional PC Interface Program
- PID Control
  - Included

**PROTECTIVE FEATURES**

- Power Loss Ride Through
  - 500 Milliseconds
- Under Voltage
  - Level Depends on Voltage Class (240, 480, or 575)
- Ground Fault
  - Phase-to-Ground on Drive Output
- Output Short Circuit
  - Phase-to-Phase on Drive Output
- Over Temperature
  - Heatsink Monitor
- Output Voltage
  - DC Bus
- Drive Overload
  - Exceed Drive rating of 150% for One Minute
- Over Current
  - Hardware Overcurrent Circuit, Software Overcurrent Fault

**AGENCY CERTIFICATIONS**

- Listings
  - UL, cUL, CE, C-Tick

**DRIVE RATINGS**

Drive Ratings				Model Number	Frame Size
Input Voltage	kW	HP	Output Current		
120V, 50/60 Hz 1-Phase	0.4	0.5	2.3A	6MDVN-2P3102	B
	0.75	1.0	5.0A	6MDVN-5P0102	B
	1.1	1.5	6.0A	6MDVN-6P0102	B
240V, 50/60 Hz 1-Phase With Integral EMC Filter	0.4	0.5	2.3A	6MDAN-2P3112	B
	0.75	1.0	5.0A	6MDAN-5P0112	B
	1.5	2.0	8.0A	6MDAN-8P0112	B
240V, 50/60 Hz 1-Phase No Filter	2.2	3.0	12.0A	6MDAN-012112	C
	0.4	0.5	2.3A	6MDAN-2P3102	B
	0.75	1.0	5.0A	6MDAN-5P0102	B
240V, 50/60 Hz 3-Phase No Filter	1.5	2.0	8.0A	6MDAN-8P0102	B
	2.2	3.0	12.0A	6MDAN-012102	C
	0.4	0.5	2.3A	6MDBN-2P3102	B
240V, 50/60 Hz 3-Phase No Filter	0.75	1.0	5.0A	6MDBN-5P0102	B
	1.5	2.0	8.0A	6MDBN-8P0102	B
	2.2	3.0	12.0A	6MDBN-012102	B
	3.7	5.0	17.5A	6MDBN-017102	B
	5.5	7.5	24.0A	6MDBN-024102	C
	7.5	10.0	33.0A	6MDBN-033102	C
480V, 50/60 Hz 3-Phase No Filter	0.4	0.5	1.4A	6MDDN-1P4102	B
	0.75	1.0	2.3A	6MDDN-2P3102	B
	1.5	2.0	4.0A	6MDDN-4P0102	B
	2.2	3.0	6.0A	6MDDN-6P0102	B
	4.0	5.0	10.5A	6MDDN-010102	B
	5.5	7.5	12.0A	6MDDN-012102	C
575V, 50/60 Hz 3-Phase No Filter	7.5	10.0	17.0A	6MDDN-017102	C
	11.2	15.0	24.0A	6MDDN-024102	C
	0.75	1.0	1.7A	6MDEN-1P7102	B
	1.5	2.0	3.0A	6MDEN-3P0102	B
	2.2	3.0	4.2A	6MDEN-4P2102	B
	4.0	5.0	6.6A	6MDEN-6P6102	B
575V, 50/60 Hz 3-Phase No Filter	5.5	7.5	9.9A	6MDEN-9P9102	C
	7.5	10.0	12.2A	6MDEN-012102	C
	11.2	15.0	19.0A	6MDEN-019102	C

**Instruction Manual**

MD65 User Manual: D2-3519-1  
 MD65 Data Sheet: RAPS-960  
 MD65 Brochure: RAPS-959

**Service Conditions**

**Altitude:** 1,000 m (3,300 ft.) Maximum  
**Ambient Temperature:** IP20: -10°C (14°F) to 50°C (122°F)  
 NEMA 1/IP30: -10°C (14°F) to 40°C (104°F)  
**Storage Temperature:** -40°C (-40°F) to 85°C (185°F)  
**Relative Humidity:** 0% to 95%, non-condensing  
**Speed Regulation:** V/Hz ± 2% of base speed across a 40:1 speed range  
 SE ± 1% of base speed across a 60:1 speed range  
**Intermittent Overload:** 150% overload capacity for up to 1 minute  
 200% overload capacity for up to 3 seconds

AC Drives

Analog DC Drives

Digital DC Drives

Options & Accessories

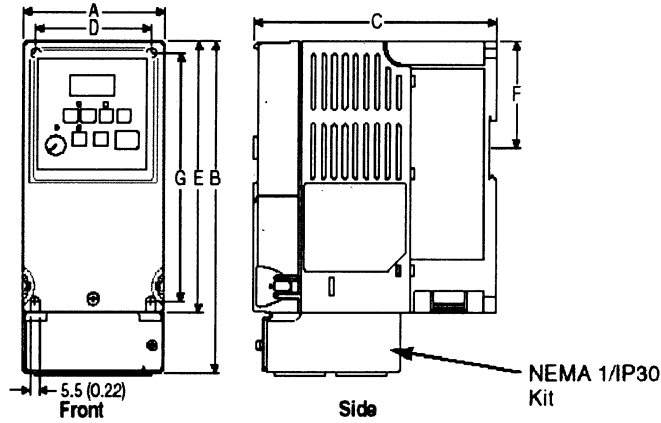
Product Demonstrators and Training

Modified Standard VFS

**MOUNTING DIMENSIONS**

Dimensions are in millimeters and (inches). Weights are in kilograms and (pounds).

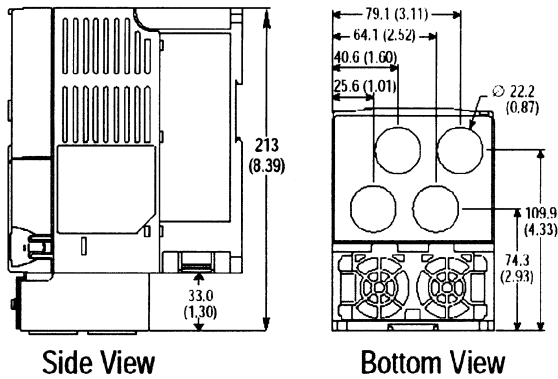
**Front View**



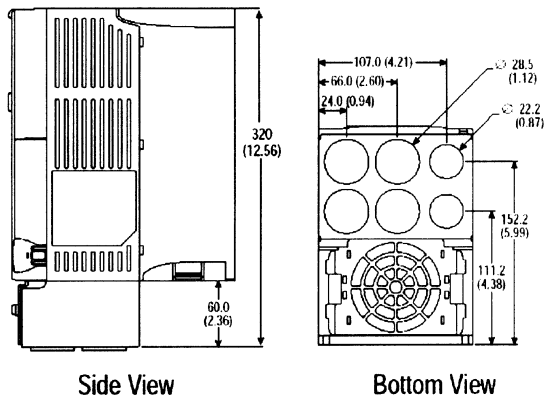
Frame	A	B <sup>#</sup>	C	D	E <sup>''</sup>	F	G	Weight
B	100 (3.94)	213 (8.39)	136 (5.35)	87 (3.43)	180 (7.09)	87.4 (3.44)	168 (6.61)	2.2 (4.9)
C	130 (5.1)	320 (12.6)	180 (7.1)	116 (4.57)	260 (10.2)	(1)	246 (9.7)	4.3 (9.5)

(1) C Frame does not have DIN rail mounting

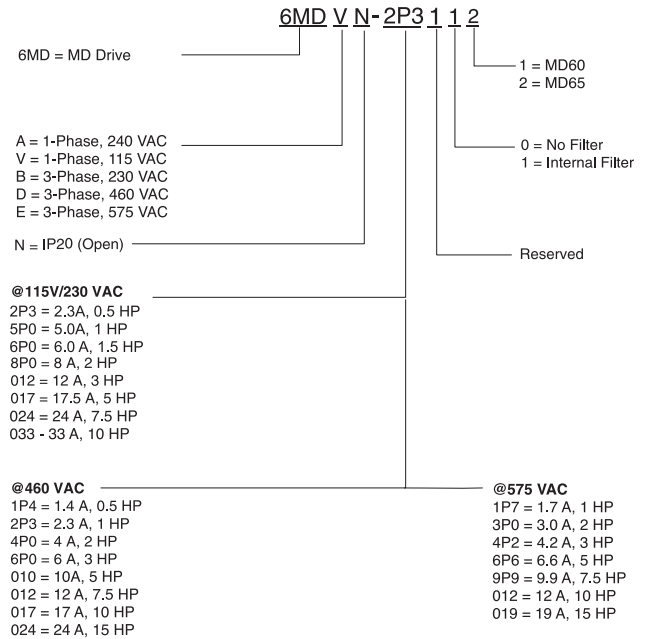
**IP30NEMA 1/UL Type 1 Option Kit**



FRAME B



FRAME C



PRICING

**Single-phase 115 VAC and 208 - 230 VAC,  
Three-phase 208 - 230 VAC, 380 - 460 VAC**

Product Features

- IP20 enclosure as standard, modifiable to NEMA 1 (IP30).
- Integral keypad and display including single turn speed potentiometer.
- Power ratings up to 15 HP with both single-phase and three-phase input ratings.
- Built-in braking transistor allows connection to remote braking resistor for enhanced performance needs.



**100 - 115 V, 50/60 Hz, 1 Phase (230 V, 3-Phase Output)**

Model Number	Frame Size	HP	Output Current	Watt Loss	List
6MDVN-2P3102	B	0.5	2.3A	30	\$486
6MDVN-5P0102	B	1.0	5.0A	56	565
6MDVN-6P0102	B	1.5	6.0A	70	701

**200 - 240 V, 50/60 Hz, 1-Phase, With Integral EMC Filter**

Model Number	Frame Size	HP	Output Current	Watt Loss	List
6MDAN-2P3112	B	0.5	2.3A	30	\$396
6MDAN-5P0112	B	1.0	5.0A	55	475
6MDAN-8P0112	B	2.0	8.0A	80	610
6MDAN-012112	C	3.0	12.0A	110	723

**200 - 230 V, 50/60 Hz, 1-Phase (230 V, 3-Phase Output)**

Model Number	Frame Size	HP	Output Current	Watt Loss	List
6MDAN-2P3102	B	0.5	2.3A	30	\$384
6MDAN-5P0102	B	1.0	4.5A	55	452
6MDAN-8P0102	B	2.0	8.0A	80	588
6MDAN-012102	C	3.0	12.0A	110	701

**200 - 230 V, 50/60 Hz, 3-Phase**

Model Number	Frame Size	HP	Output Current	Watt Loss	List
6MDBN-2P3102	B	0.5	2.3A	30	\$497
6MDBN-5P0102	B	1.0	4.5A	55	565
6MDBN-8P0102	B	2.0	8.0A	80	712
6MDBN-012102	B	3.0	12.0A	115	791
6MDBN-017102	B	5.0	17.5A	165	972
6MDBN-024102	C	7.5	24.0A	226	1436
6MDBN-033102	C	10.0	33.0A	290	1662

PRICING cont'd

**380 - 460 V, 50/60 Hz, 3-Phase**

Model Number	Frame Size	HP	Output Current	Watt Loss	List
6MDDN-1P4102	B	0.5	1.4A	30	\$593
6MDDN-2P3102	B	1.0	2.3A	40	644
6MDDN-4P0102	B	2.0	4.0A	60	746
6MDDN-6P0102	B	3.0	6.0A	90	893
6MDDN-010102	B	5.0	10.0A	150	1074
6MDDN-012102	C	7.5	12.0A	160	1436
6MDDN-017102	C	10.0	17.0A	200	1639
6MDDN-024102	C	15.0	24.0A	TBD	Consult Factory

**575 V, 50/60 Hz, 3-Phase**

Model Number	Frame Size	HP	Output Current	Watt Loss	List
6MDEN-1P7102	B	1.0	1.7A	TBD	\$791
6MDEN-3P0102	B	2.0	3.0A	TBD	899
6MDEN-4P2102	B	3.0	4.2A	TBD	1051
6MDEN-6P6102	B	5.0	6.6A	TBD	1243
6MDEN-9P9102	C	7.5	9.9A	TBD	1622
6MDEN-012102	C	10.0	12.2	TBD	1837
6MDEN-019102	C	15.0	19.0A	TBD	2261

# MD65 Accessories

## NEMA 1/IP30 Kit

The MD65 AC drive has an enclosure rating of IP20, but includes provisions to mount a NEMA 1/IP30 kit. This kit provides a metal conduit plate for attaching user conduit, as well as a plastic top cover for the drive.



MD65 NEMA 1/IP30 Kits		
Description	Model Number	List
MD65 IP30/NEMA 1 Kit, Frame B	6MD-NM1B	\$15
MD65 IP30/NEMA 1 Kit, Frame C	6MD-NM1C	15
MD65 IP30/NEMA 1 Kit, Frame B (1)	6MD-NM1COMB	28
MD65 IP30/NEMA 1 Kit, Frame C (1)	6MD-NM1COMC	28

(1) These NEMA 1 Kits are for use when the 6MD-COMMCVRB or 6MD-COMMCVRC Communication Cover Kits are installed on the MD65 drive.

## EMC Compliance Filters

The MD65 drive has been designed to conform to global industry standards for EMC compliance, including Europe and Australia. To meet the conducted and radiated emission standards of EN 61800-3, the filters listed below must be used, depending on the motor cable length. Reference the MD65 User Manual (D2-3519) for details on the filters and their installation. Also be sure to follow recommended wiring practices for drives and motors as identified in the MD65 User Manual.

MD65 EMC Filters		
Description	Model Number	List
<b>External EMC Filter for Short Cable Distances</b>		
MD65 EMC filter (5 meter), 1/2-5 HP, 230 V, 3 ph	6MDF-021BS	\$85
MD65 EMC filter (5 meter), 1/2-5 HP, 460 V, 3 ph	6MDF-012BS	73
MD65 EMC filter (5 meter), 7.5-10 HP, 230 V, 3 ph	6MDF-034CS	113
MD65 EMC filter (5 meter), 7.5-10 HP, 460 V, 3 ph	6MDF-018CS	102
<b>External EMC Filter for Long Cable Distances</b>		
MD65 EMC filter (100 meter), 1/2-1 HP 115, 1/2-2 HP 230 V, 1 ph	6MDF-018BL	\$79
MD65 EMC filter (100 meter), 3 HP 230 V, 1 ph	6MDF-025CL	113
MD65 EMC filter (100 meter), 1/2-5 HP 230 V, 3 ph	6MDF-021BL	113
MD65 EMC filter (100 meter) 7.5-10 HP 230 V, 3 ph	6MDF-034CL	147
MD65 EMC filter (100 meter), 1/2-5 HP 460 V, 3 ph	6MDF-012BL	107
MD65 EMC filter (100 meter), 7.5-10 HP, 460 V, 3 ph	6MDF-018CL	147

NOTE: The 230 V, single-phase input drives are available with a factory installed filter option, and may not need to have the external filters listed above installed to meet the required emission standards. Contact Reliance or reference the User Manual (D2-3519) for details.

## DB Resistor Kits

The MD65 drives include power terminals for connecting low power dynamic braking resistors. These resistors are not enclosed and must be separately mounted.

For enclosed braking resistor options, reference the GV3000SE section, page D-55. Select resistors from the chart on page based on the power rating of the MD65. Also, refer to the MD65 User Manual for connections and parameter setup when using braking resistors.

Drive Rating (HP)	Nominal Value (Ohm)	Resistor Rating (W)	Model Number	List Price
<b>230 V DB Resistor</b>				
1	91	500	AK-R2-091P500	\$203
2	91	500		
3	47	500	AK-R2-047P500	203
5	47	500		
7.5	30	1200	AK-R2-030P1K2	271
10	30	1200		
<b>460 V DB Resistor</b>			<b>Model Number</b>	<b>List Price</b>
1	360	500	AK-R2-360P500	\$203
2	360	500		
3	120	1200	AK-R2-120P1K2	271
5	120	1200		
7.5	30	1200		
10	30	1200		

**V\*S Utilities Configuration Software**



The MD65 drive can be configured using the V\*S Utilities software. The V\*S Utilities software kit includes the standard Reliance

PC software. All necessary cables and the serial converter are included in the MD65 Serial Converter Kit. Reference the D2-3502 Serial Converter Module Instruction Manual for details.

V*S Utilities Software and Cables		
Description	Model Number	List
MD60/MD65 Serial Converter Module Kit: Includes serial converter, RECBL-SFC converter to PC cable, and MDCBL-RJ45 MD60/MD65 to converter cable	MDCOMM-232	\$306
VS* Utilities software CD	RECOMM-VSUTIL	154
MD60/MD65 Serial Converter Module, cables and V*S Utilities software CD	MDCOMM-VSU232	437
RJ45 to RJ45 cable (MD60/MD65 to converter)	MDCBL-RJ45	15
Serial converter to computer cable	RECBL-SFC	57

**MD60/MD65 CopyCat OIM**

The MD60/65 CopyCat OIM is a handheld LCD based display with a full numeric keypad. It comes standard with a 1 meter cable for connection to the MD60/MD65 drive and allows for uploading, downloading, monitoring and configuring software parameters. Up to 9 different sets of parameters for the MD60 and 5 different sets for the MD65 can be stored in the keypad.



The CopyCat OIM can be used as a handheld terminal or mounted in a NEMA 1 Bezel Kit (see below).

Model Number: MD1CC ..... \$189

**MD60/MD65 NEMA 4X Remote Mount OIM**

Remote mountable LCD OIM for door mounting. Back lit graphical multiline display and ICON menu. Includes standard 2.9 meter cable for remote mounting.

If lengths greater than 2.9 meters are required, you can select a MDCBL-CC1 or MDCBL-CC3 for cable extension for lengths up to 10 meters.

Model Number: MD4ALCD ..... \$291



**MD60/MD65 Cable Accessories**

The MD65 drive provides an RJ45 port to allow the connection of a single peripheral device. The RJ45 Splitter Cable can be used to connect a second MDI peripheral device to the drive.

MD60/MD65 Cable Accessories		
Description	Model Number	List
RJ45 to RJ5 Cable (MD60, MD65 converter)	MDCOBL-RJ45	\$15
OIM Cable (1.0 meter OIM to RJ45)	MDCBL-CC1	23
OIM Cable (2.9 meter OIM to RJ45)	MDCBL-CC3	34
MDI Cable, Two Position Terminal Block, 5 pcs./pkg.	AK-U0-RJ45-TB2P	23
MDI Cable, RS-485 Terminating Resistor, 2 pcs./pkg.	AK-U0-RJ45-TR1	6
MDI Splitter Cable	AK-U0-RJ45-SC1	17

**MD60/MD65 NEMA 1 Bezel Kit**

The NEMA 1 Bezel Kit provides a convenient means for panel or door mounting of MD1CC CopyCat Keypad. The kit includes a one meter RJ45 to RJ45 cable.



Model Number: MDBZL-N1 ..... \$68

**Communication Cards**

**DeviceNet Card**

The DeviceNet communication card mounts internal to the MD65 drive and receives power from the drive and network. Switches or parameters allow node and data rate configuration. Explicit UCMM, Polled Cyclic and Change of State messages are supported. Specify cover kit according to the drive frame size.

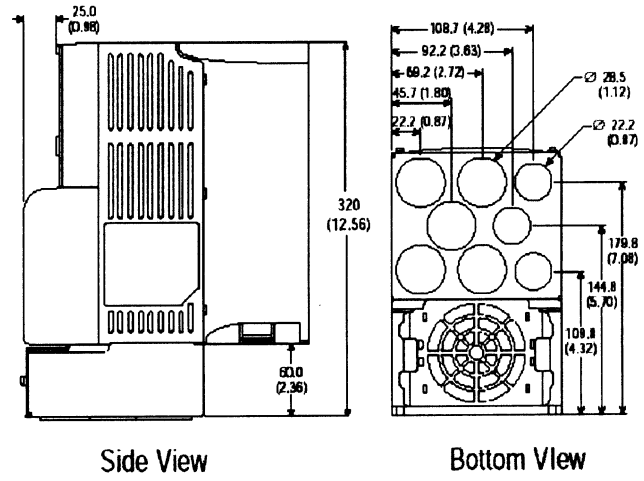
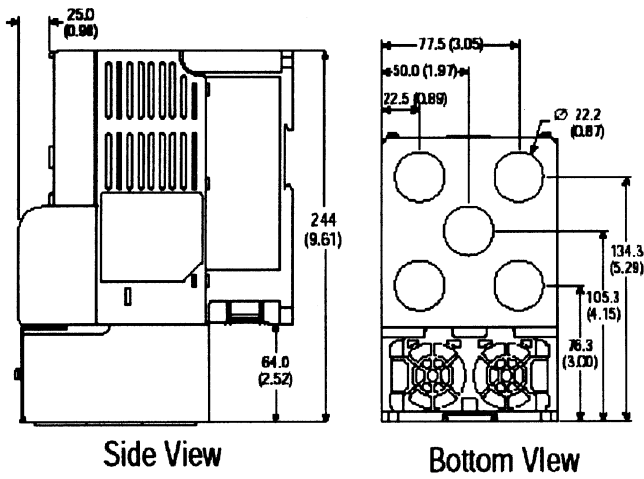


MD65 Communication Cards & Cover Kits		
Description	Model Number	List
MD65 DeviceNet Communication Card	MDCOMM-DNET	\$317
B Frame Communication Cover Kit	6MD-COMMCVRB	23
C Frame Communication Cover Kit	6MD-COMMCVRC	23

(1) The 6MD-COMMCVRC Communication Cover Kits are required for installation of the DeviceNet Cards in the MD65 drive.

**DeviceNet Mounting Dimensions**

Drive Dimensions - NEMA 1/IP30 Kit with Communication Option.  
Dimensions shown in mm (in).



Frame B

Frame C

AC Drives  
Analog DC Drives  
Digital DC Drives  
Options & Accessories  
Product Demonstrators and Training  
Modified Standard V/S